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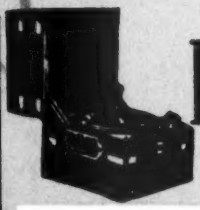
The AMERICAN HOROLOGIST

INCORPORATING

HOROLOGY

THE NATIONAL MAGAZINE
FOR ADVANCEMENT IN TIMEKEEPING



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Vol. 10 AUGUST, 1943 No. 8
TENTH YEAR OF PUBLICATION

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YOU'LL realize the broad truth of this axiom every time you stop to analyze even the normal fluctuations in business... ...and under these trying war conditions, it has a special and pointed significance:

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TENTH YEAR OF PUBLICATION

The AMERICAN HOROLOGIST

Incorporating HOROLOGY

Published Monthly

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To advance Education | **To assist in Obtaining State Legislation** | **To Develope Standardization** | **To Encourage & Recognize Effort & Ability**

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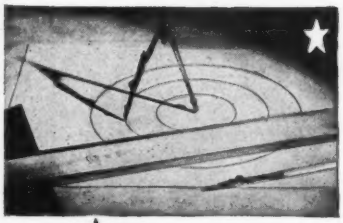
Rendezvous with Victory



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ODD But TRUE

By Weil

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THOMAS TOMPION (1638-1713) WAS THE FIRST ENGLISH CLOCKMAKER TO MAKE CLOCKS THAT REALLY KEPT TIME. BEAUTIFUL WATCHES WERE MADE BEFORE BUT THEIR PERFORMANCE USUALLY WAS INDIFFERENT!
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POLISH PATRIOTS CAUGHT POSSESSING VALUABLE TIMEPIECES ARE GIVEN TWENTY LASHES BY THEIR GERMAN OVERLORDS. THE NAZIS FEEL THAT THESE MIGHT BE USED TO BRIBE SPECIAL PRIVELEGES.
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U. H. A. of A. and Licensing Boards National Conference September 20, 1943

U. H. A. of A. Executive Board, was partitioned by State Licensing Boards, to hold a Conference in conjunction with National and State officers, after three months preliminary work the National Executive Board, Board of Trustees and State Associations by vote, has called this emergency conference for September 20th, 21st, & 22nd, 1943, to be held in Denver, Colorado at National Headquarters.

State Legislation for all states is paramount. Definite planning for same will take place at Conference. States, whether affiliated , or not should be represented. Now is the time to sacrifice a portion of our time, as valuable as it is, to protect our crafts and industries best interest for the immediate future. Remember the past,—let's not have a repetition of the same.

Standardization of school and apprenticeship systems.

Uniform or cooperative examining and receprosity for States.

Repair standardization, not prices, as a fixed standard will adjust prices.

Definite plans for Association action in all it's endeavors, for strengthening our units and the furtherance of amalgamated ideas and ideals.

Examing Boards and Association officials are fervently preparing their programs to come before this conference.

As secretary Guild of H. I. A. states in reply to recent article (What standards shall we adopt), "we have some serious consideration ahead in connection with future standards of workmanship in watch-repairing."

Many individuals and organizations are showing marked concern towards the future. Watchmakers, even though now well paid, and over-taxed with work are thinking of the future and alert to the well being of our profession and themselves.

Any and all in the industry are invited to attend, but registrations must be made at once, so as to allow for additional accomodations.

Enthusiasm and work are equal parts of success.

Notes On The Marine Chronometer

By W. H. SAMELIUS

When cleaning and setting up the chronometer, there are many essential points that must be taken care of to make the instrument a reliable timepiece. Each and every part must be carefully examined.

Beginning with the balance staff, the balance pivots must be perfectly cylindrical, highly polished and the ends of the pivots slightly rounded. The end shake for the balance pivots may be .002" and the side shake .0005".

The balance hole jewels may olive shaped, set perfectly flat and concentric. It is well to check the settings and the jewels that they are perfectly tight and that the setting seats itself square and flat. The cap jewels must also be set perfectly flat, allowing .001" to .002" space between the cap jewel and hole jewel for oil. The balance wheel must run perfectly true in the round and flat. Testing the balance to make certain that it is held securely to the staff by means of two screws. The balance must also be well poised. The hairspring is of the helical type, the upper and lower terminals are formed so the hairspring is truly centered at the collet as well as at the stud end. When in action, the hairspring must expand and develop at the top and bottom an equal amount in all directions. The hairspring must also be adjusted so it is perfectly upright and concentric with the axis of the balance. It also must be adjusted for height so as to eliminate any excessive pull or crowding as the spring expands or contacts.

The escape wheel pivots are highly polished, allowing the same tolerance as for the balance pivots. The escape

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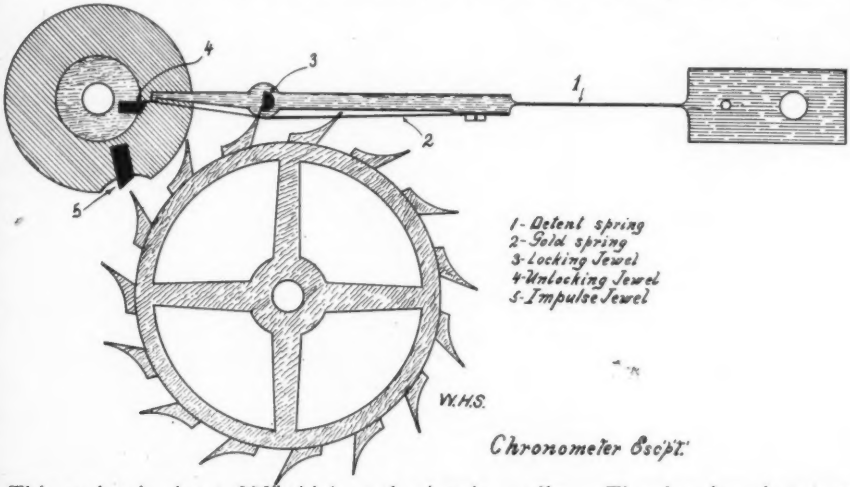
wheel must be perfectly true in round and flat. The escape wheel must be examined closely for any apparent wear at the tips. If the teeth show wear, trouble may show up in the locking of the escapement. It is possible that the tooth will trip by the locking stone allowing the oncoming tooth of the escape wheel to come to rest on the face of the impulse roller, hindering the free action of the balance. The total lock and slide when the escape wheel is at rest on the locking stone, may be .012" and thickness of tip of escape wheel tooth may be approximately .004".

The gold spring is generally made of 10K gold, although some chronometer makers deviate from the gold spring and use other alloyed metals. This spring is about .003" thick at the outer end and diminished in thickness from .0015" to .002" thick at the screw end. The purpose of making the spring this way is so flexation occurs at the Base of the spring rather than at the front end, offering less resistance as the unlocking jewel trips past the end of the gold spring on it's return excursion, being thicker on the outer end, the gold spring will not buckle as the unlocking jewel strikes the gold spring and lifts the detent, unlocking the escape wheel. The hole in the end of the gold spring is elongated so it may be adjusted forward or backward as conditions require.

The detent is made of steel, hardened and tempered to spring temper. The springs runs from .002 to .003 inch thick.

When setting up the escapement, we check the locking jewel to see that it is absolutely upright and securely fast in the spring. The flat face of the jewel is set at a 6 degree angle for draw. This assures us that when a tooth comes to rest on the locking stone, the detent will draw into the tooth. The amount of locking on the face of the stone can be .010 to .012 inch, the detent adjusted forward or backward as conditions require, allowing the two escape teeth equal freedom to the periphery of the impulse roller. The freedom between these two teeth and the impulse roller may be .005 inch to .006 inch. The total lock and slide of the escape wheel is controlled by a banking screw, conveniently located under the escapew heel and threaded in to the potence that is fastened to the upper plate.

When the position of the locking jewel has been satisfied, the length of the gold spring is then adjusted so the unlocking jewel engages the gold spring on the center line, lifting the detent, allowing the escape wheel to



Chronometer Escpt.

THE EXECUTIVE WHO STOPS TO THINK . . .

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That's why the Treasury Department now urges you to revise your War Bond *thinking*—and your War Bond *selling*—on the basis of *family* incomes. The current War Bond campaign is built around the family unit—and labor-management sales programs should be revised accordingly. For details get in touch with your local War Savings Staff which will supply you with all necessary material for the proper presentation of the new plan.

Last year's bonds got us started—*this year's bonds are to win!* So let's all raise our sights, and get going. If we all pull together, we'll put it over with a bang!

This space is a contribution to America's all-out war effort by

you've done your bit . . . now do your best!

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pass by the locking stone. The total lift of the unlocking jewel should be .003 inch to .004 inch beyond the tip of the escape wheel tooth. This assures us that the escape wheel tooth, as it is released, will not drag on the edge of the locking jewel.

The position of the unlocking jewel and impulse jewel is very important. When the unlocking jewel has released the escape wheel, the impulse jewel must be in the path of the oncoming tooth. For a manual test, the escape tooth must drop as stated above, on the face of impulse stone, however, when the instrument is in action, the impulse jewel, moving at a rapid speed, and is well advanced of the escape tooth, due to the fact it takes a fraction of time for the escape wheel to pick up speed. In other words, it lags behind, so many chronometer makers will set the impulse jewel so that when the escapement is tested manually, the escape tooth misses the impulse jewel entirely. Proper action of the escapement does not occur until the balance takes at least one-half turn. The amount of these final adjustments must be determined by the workman as all escape wheels do not act the same, some wheels being heavier than others, would naturally be more sluggish or slower to get in motion, which would govern the proper position for the impulse jewel to receive full impulse from the escape wheel.

The impulse and locking jewel are mounted in separate rollers fitted friction tight to the balance staff. When adjusting the escapement to proper drop of the escape tooth onto the impulse jewel, the adjustment is made by turning the large roller in either direction. By turning the small roller to obtain proper drop or impulse would be throwing the escapement out of beat, necessitating turning the hairspring collet to put the instrument in beat, entailing more work than is necessary. The arc of the balance may be anywhere from one to one and one-half turns as long as the arc is constant throughout the 24 hours.

When setting up the mainspring, it is well to determine the full number of turns available in the barrel, then attach chain to fusee, winding the spring, taking note how many turns of mainspring are absorbed for this part of the operation. Deduct the actual number of turns consumed to fill the fusee from the actual number of turns the mainspring yielded, then wind the spring tight in the barrel and release one-third of the surplus turns, allowing two-thirds of surplus turns when the instrument has run down.

This rule may vary somewhat, testing the arc of the balance when the instrument is fully wound and then checking the arc of balance when the instrument is near the end of the run, should determine whether the mainspring is set up too much or not sufficient. If the arc of the balance falls off considerably when the instrument is in the last part of it's run, would indicate that the mainspring should be set up, possibly another half turn. Chronometer makers use an adjusting bar for setting up the mainspring. By use of the adjusting bar, the tension of the mainspring can be adjusted so that the tension of the spring is equal throughout it's entire run. This adjusting bar is attached to the square of the fusee. An article on the adjusting bar appeared in the April 1942 issue of the AMERICAN HOROLOGIST.

When putting the escapement in beat, the hairspring collet is turned on the staff so that when the balance is at rest, the unlocking jewel is in slight contact with the gold spring. The unlocking jewel may either rest on the front of the spring or at the back of the spring. This is an open question and all chronometer makers do not agree on the fixed position of the unlocking jewel and the gold spring as to when the chronometer is in beat, as in either case, the performance of the chronometer will be satisfactory.

The train in the marine chrono-

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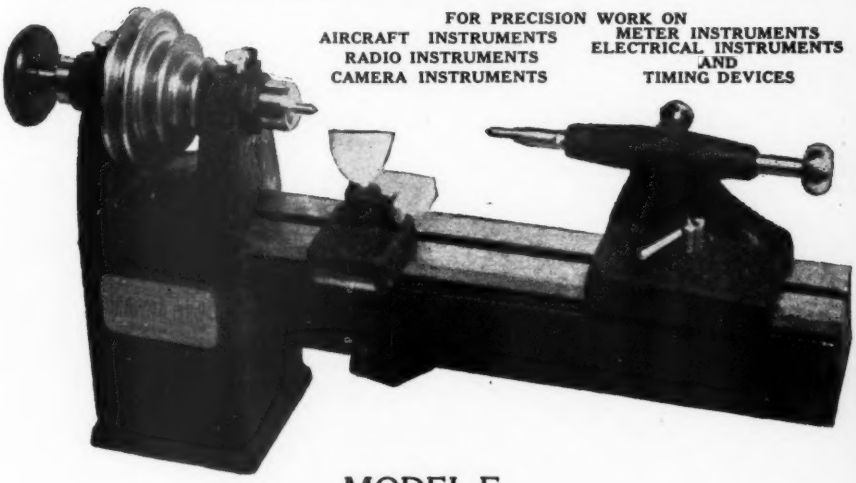

MODEL F

SPECIFICATIONS

Bar Capacity	3/16" or 5mm.
Maximum distance between centers	5"
Maximum swing	4"
Length of bed	9"
Maximum spindle speed recommended	3000 r.p.m.

Straight spindle—split type—adjustable bearings, with oil cups.

Tail stock—goose neck style—adjustable centering spindle.

Simple tool rest—tip-over style.

Belt drive—round 3/16" belt—3-step pulley.

Uses watchmakers lathe No. 2WW style collets.

Bed form—square section—1½" wide.

Instrument Equipment & Tools Distributors 229 WEST 5TH STREET LOS ANGELES 13, CAL.

meter varys somewhat in combination of wheel teeth and train wheels, however, they were all constructed to beat 14,400 per hour, or 4 beats per second. As the balance makes 4 vibrations per second, two of these vibrations do not receive an impulse, the other two receive impulse and advance the train in half second counts, thereby showing half seconds and seconds on the seconds dial.

Pocket chronometers were usually made to beat 18,000 per hour, or 5 per second. As the pocket watch is subjected to more pars or twists while in the pocket, the escapement is less liable to set, owing to the fact that the balance is in more rapid motion than the balance in the 14,400 train.

The form of the teeth in the marine chronometer is usually of the epicycloidal curve, although we do find some instruments where this curve has been modified. Of late, the involute curve is being adopted. The wheels are all made of specially treated brass and hardened by rolling or hammering. The pinions are made of the finest steel and tempered. All steel parts are highly polished and scrutinized for any deformities that might occur thru the polishing process.

The following combination of wheel teeth and pinions are practically standard today for all 50 to 60 hour chronometers.

Great Wheel: 90 teeth, P; Center Wheel: 90 teeth, Pinion-14; Third Wheel: 80 teeth, Pinion-12; Fourth Wheel: 80 teeth, Pinion-10; Escape Wheel: 15 teeth, Pinion-10.

While calculating this train, it is found with the balance making a complete vibration (and the escape wheel advancing one tooth) every half second, the fourth pinion, which carries the second hand, will make one revolution per minute.

Means for regulating a chronometer are provided for by meantime screws at the end of balance arm. Under no circumstances move the large weights attached to the balance rim as they are placed in a fixed position on the rim of the wheel for temperature adjustments. Adjusting the chronometer for temperature rates can only be done by the chronometer makers who are equipped with a cold box where the temperature can be regulated, or an oven that is thermostatically controlled to a fixed temperature. The cold box is also thermostatically controlled to a fixed temperature.

Repairing Repeating Watches

By C. T. ETCHELLS

(Continued from July)

In all my experience I can only recall one instance of a watch of this particular type, an old duplex half-quarter repeater by McCabe, which appeared likely to master all my efforts to get the half-quarter to act properly, and though I felt convinced I should be justified in altering the shape of the half-quarter rack at the point of contact with the click which controls the shifting of the same, I loath to do so, as there did not appear to have been any serious tampering with it, though undoubtedly the shape has been slightly altered. I, however, did at last make the alteration according to my conviction in the matter, but not before I had given it every consideration, and taken counsel with others, and was gratified to find I obtained the exact result required, and did not therefore consider the loss of time a waste of time.

Of course there is no hard and fast rule in watch work, and the fault met with in the job today may not present itself again for years. It would therefore be unwise to go upon the plan of a workman I once met in the country, who because he found a watch stopping in consequence of the barrel fouling the name bar, made an absolute rule of filing every name bar in future, whether it wanted it or not (fact) though I can positively assert that this rule did not have the effect of rendering him quite free from stops in future.

There is one thing to be said in favor of the half-quarter repeater,

and that is: that it was made principally in the good old times, when plenty of time was devoted to the work, with a view of durability; and consequently faults do not arise as a rule from absolute wear, as the endeavor seemed to be to put in the finest material, at the same time making it of the best possible temper. Indeed, this applies to all the old watches as regards the quality and temper of the material, as any reader is aware who comes across a specimen from time to time. This is unfortunately, a very different character than can be given in the majority of work in the present day, where the demand is for cheapness, the result being that you get the steel work left absolutely soft, and of course in this state it is impossible to impart the same amount of finish to the work, hence roughness in the action and speedy signs of wear in parts of contact.

The following plate shows an old specimen of a French quarter repeat-

FIG. 3

er, apparently of very ancient origin; the movement and dial bear the name Chevalier and Compaignie. It has a verge escapement, and for repeating was pushed from the pendant as was customary with all the earlier specimens; it has also the chain connection from the gathering rack at pendant passing around a roller A near the edge of plate, and attached to and passing around a smaller roller B, on the square of the repeating barrel arbor.

It will be seen that the quarter rack is minus a tooth at C, and has the two remaining teeth mutilated; it is also minus one of the quarter pallets, and the hook has disappeared from the square of the repeating barrel arbor by which the quarter rack should be gathered; all indications that it has been in the hands of the Philistines.

The hour rack is in a piece with the barrell arbor, and consequently between the plates, as mentioned in a previous paragraph.

Another indication of the antiquity of this specimen is the fact of the winding or fusee square coming through the dial. It will also be observed that the "all-or-nothing" piece, D, is pierced to admit of the fusee square and keypipe passing through for winding. One of the greatest difficulties met with in this type of repeater arises in the event of the breaking of the chain connecting the gathering rack for winding up the repeating mainspring, as great care is required in repairing the same to readjust to the proper length again, and can only be accomplished with great care and trouble, and probably with many failures; the endeavor should be to manage as near as possible to obtain links of chain to replace those spoiled, as near to size as you can to those remaining.

It will be seen that the star wheel, to which is attached the hour snail, is carried by the "all-or-nothing" piece, and when displaced by the gathering rack is capable of a small recoil which releases the quarter rack; this is modified in the more modern repeater by the star piece revolving on a stud fixed in the plate, and the "all-or-nothing" piece shown here is replaced by the spring "all-or-nothing," which I will endeavor to show and describe, as also I will endeavor to show the movement of a half-quarter repeater from which the rack and snail shown here in Figure 1 and 2 are taken.

The following figures show the movement from which the rack and snail were taken. I have not replaced either the said rack or snail, as they would have hidden the other pieces

which I wish to draw special attention to on this occasion. My object is to show clearly first, the gathering rack A, and secondly, the intermediate wheel B which gears into the teeth of former, and also into smaller wheel on square of repeating barrel arbor, for winding up repeating main springs, being more modern and a great improvement on the old system as represented in the ancient specimen, having chain connections as previously shown. One point, subject to injury (and which requires careful treatment to readjust), is the shoulder screw which secures the intermediate wheel, and very little reflection will convince the thoughtful that the careless fitting of a new screw here would soon lead to difficulty, as being across or double depth it complicates matters somewhat, and any roughness here would cause jerking in gathering or winding, and also cause the strokes of the hammer to be given in a spasmodic manner, but of course this can all be avoided if care is exercsied in retapping plate not to alter position; should the depths, however, get shifted, the best plan to adopt will be to repitch them, using the depth tool for the purpose I should next like to call attention to the slidework of above figure, my reason being that having originally been pushed from the pendant, the winding up of repeating is now done on the more modern principle, viz.: with the slide (the movement having evidently been put into a new case at

FIG. 4.

the same time). My desire is to specially call attention to the manner in which the conversion has been accomplished, so as to enable any reader to adopt the same method in case of requirement, as, although I have seen several which have at some time been transferred, I never saw one which has been done in so simple, and at the same time so thoroughly, workmanlike style. Figure 5 is somewhat of a snail-shaped piece intro-

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duced into the pillar plate below the gathering rack, and having a sink turned to receive it. It will be seen by referred to figure of movement that I have pressed arm or tail of gathering rack onto hour snail in readiness to be released for striking the hour of five, this allows snail-shape piece (Fig. 4) to be really seen, showing outside extremity of same projecting beyond outer edge of movement (and which engages with slide in case), while the inner point engaged in depressing gathering rack at C, where pressure originally came from pendant pushpiece, being in reality the reverse end of tail of rack mentioned above, and being securely fixed to same by means of screw and steady pin on under side.

FIG. 5. FIG. 6.

The hour rack, or ratchet D, being in this specimen (unlike the former one) separate from the barrel arbor, is seen above the plate; screwed on to it is a nut gearing with intermediate wheel for winding, surmounted by hook for gathering quarter rack, each of which is fitted on to square of barrel arbor, hook and square being drilled across with the pin passing through to secure them in position. Having fixed the whole in readiness, on being released to repeat the hour of five, as before mentioned, allows of the whole twelve teeth of the hour rack or ratchet D to be clearly seen, with the pallet engaged (when released) for raising hammer to give the five strokes required, and also gives a fair view of the star wheel, and likewise hour snail, with rack tail E pressed onto the fifth step or division of snail. The "all-or-nothing", being capable of a slight recoil, releases the quarter rack, and after striking returns in position and remains locked until the slide is again drawn, and so on as often as desired, hence the name "Repeater." And now for a description of the more modern or spring "all-or-nothing, as shown in Figure 6.

It differs from the old considerably in form, and as it undoubtedly is much less complicated in construction, we must admit its superiority over the former, and though differing in form the action is very similar. The star wheel and hour snail, in place of being carried by the "all-or-nothing" is revolved on a fixed stud in the plate, and the quarter rack is released by pressure being transmitted from arm of gathering rack through a small finger being driven into contact with the "all-or-nothing" at its thickest part at the moment of the slide being drawn back to its full extent. The pressure given causes the "all-or-nothing" to give at its thinnest part which forms a spring, hence the term spring "all-or-nothing." The rack arm in this type is not made in a piece with the rack, but is made separate from it, and until recently was attached (as is also the finger) by means of a shouldered screw, and both rack and arm have an elongated slot in them thus permitting of a slight backward and forward movement to the arm, so that when the arm comes in contact with the snail being capable of this action, it is driven backwards, and having an upright stud at the reverse end, which immediately makes pressure on the small finger, which is also driven backwards, and its extreme point touching the "all-or-nothing" at its thickest part, causes it to recoil by means of its spring, thus releasing the quarter rack in the same manner as in the previous case. The latest method is to make the gathering rack and arm in two distinctly separate pieces, but both operating from a fixed stud in the plate and accomplishing the same result precisely, and in a very similar manner; the latter type is probably the outcome of necessity, in consequence of the repeater being required to strike the minutes in addition to the hours and quarters, as it permits of the various parts being

made on a smaller scale, thus utilizing the room required for the increase of complications.

The fault I will first call attention to is a troublesome one, though fortunately one not frequently met with; it is the two blows of the quarters following each other so rapidly as to appear almost as one blow.

To remedy this, it will be necessary to lengthen the three teeth of the uarter rack which raise the hammer giving the last blow to each quarter; or it may be that only one or two of the teeth will require lengthening. This must be accomplished by stretching which can be done by laying the rack on a smooth steel stake, having the under side of the rack uppermost; and by using a rather sharp rounded punch (having someone to assist with the hammer), a very creditable job can be made of it; and as very little stretching will probably be required, there need be no disfigurement of the rack if care be exercised. In most cases there will be no fear of accident either, the only chance of this being where the watch is one of the good old sort, when there would be great risk of breakage, in consequence of the high temper of the steel; it will therefore be wise to first test the piece to see whether it be very hard, and if so, the temper must be lowered by blueing, and the color afterwards removed.

This fault is generally the outcome of wear at the points of action of the pallets and rack teeth, or the enlargement of the holes of the hammer pivots and might be remedied by new holes of new pallets; but as the latter would be too long and costly a process in ordinary jobbing, we must be satisfied to resort to the more rough and ready method mentioned, and stretch the teeth; but before doing this it will be advisable to make sure that the fault is not caused by the stud which carries the quarter rack being loose in plate, or having got

(Continued in September)

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Waterproof Watches

(*From Horology January*, 1940, *By* Louis & Samuel Levin)

PART TWO

The development of waterproof watch cases continues its way with the granting of several more patents to Swiss manufacturers. In Fig. 15 is shown an arrangement in which an unbreakable crystal is firmly attached to a part of the case in such a manner as to form a seal against dust or moisture.

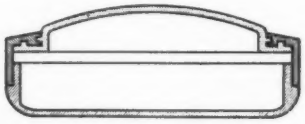

Fig. 15. Newly patented method of Joining crystal to case in waterproof seal.

In Fig. 16 is a method of waterproofing the pusher of a chronograph which was developed by the Longines Watch Company. The principal feature is the rubber tube A which keeps out dirt and moisture and at the same

time allows the pusher to be depressed. It also serves as a spring to return the pusher to its starting position instead of depending on a delicate spring of the movement for such an action.

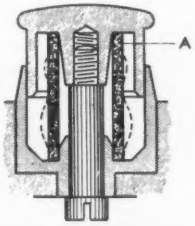

Fig. 16. Method of waterproofing chronograph pusher

Racine

Racine watches, with movements by Gallet, are encased in stainless steel cases with screw backs. As shown in Fig. 17 the back of the case has 10 sides milled into it so that it can be turned with a wrench.

The socket wrench supplied for opening cases of this type fits very marks are produced when using it. closely so that no burrs or other In order to get a good grip on the case, a supporting block or vise with special jaws should be used. The decagon socket wrench is shown in Fig. 18.

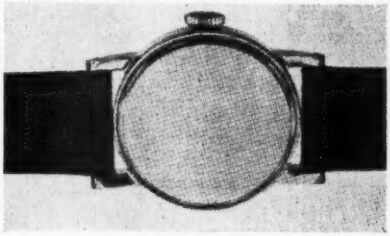

Fig. 17. Racine waterproof case.

After the back of the case has been removed, the movement will be seen to be covered by a cap with a little raised nodule. On the circumference of this cap there is a notch into which a case opener may be inserted. After taking off the cap, it will be seen that it is fitted to a ring surrounding the movement. The stem is removed by

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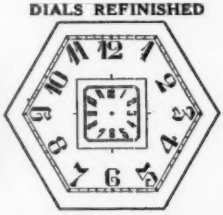

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releasing the detent screw, after which the movement can be lifted out.

The case and bezel are integral and the crystal is of the unbreakable type.

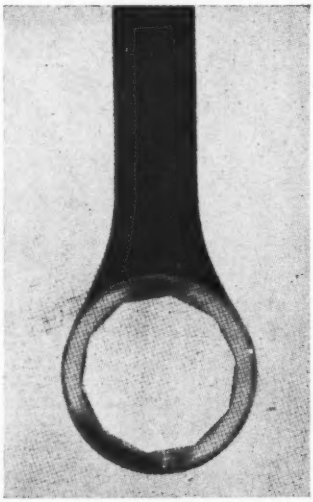

Fig. 18. Decagon socket wrench for Racine case.

The movement is held in its surrounding ring by two screws, which in an ordinary case would be the case screws. The ring, in turn, rests on the underside of the reflector at the circumference of the crystal.

The cap which fits on the ring is of thin metal and, therefore, flexible. The back of the case, when screwed up tightly, presses on the raised center of the cap and thus holds the movement in place.

The method of waterproofing the case is shown in Fig. 20. At A is the cap over the movement and at B is the retaining ring around the movement. At C is a lead gasket which seals the back of the case. The stem is waterproofed by means of the soft, composition tube D.

Pierce

The cases of both the 10½ ligne and 8¾ ligne Pierce watches are similar in construction. They are made of stainless steel and integral with the bezels. They differ from the previously described types of cases in that the

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backs are held on with four screws, as illustrated in Fig. 21. Separating the case and the back is a thin, soft, metal gasket, which serves as a seal.

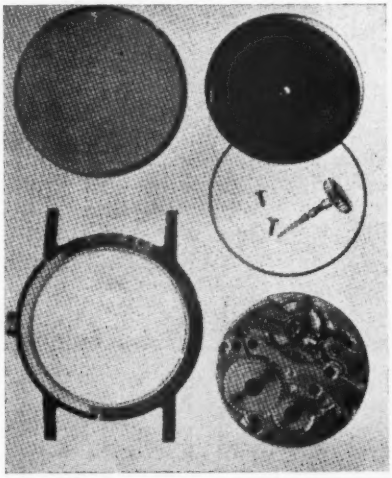

Fig. 19. Racine movement and case. The cap with the raised center rests on the ring which surrounds the movement.

When removing the back from a 10½ ligne case, the horologist will notice that a thin ring will very likely

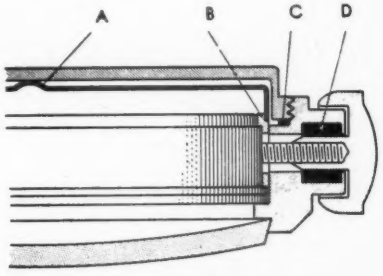

Fig. 20. Cross Section of Racine waterproof case.

stick in the cavity of the back and come off with it. This ring is designed to be flexible and holds the movement firmly against a ledge in the case when the back is tightened.

To remove the movement, the detent screw is released and the stem

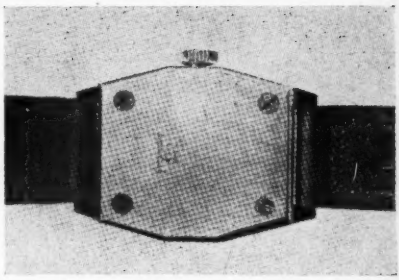

Fig. 21. Pierce 10½ ligne waterproof case.

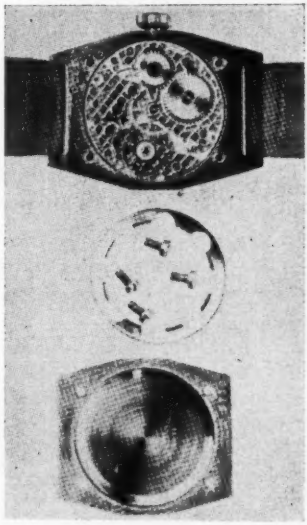

Fig. 22. Pierce 10½ ligne watch with back removed, showing spring ring which holds movement in place.

taken out, as in the case of an ordinary watch.

While the 8¾ ligne case is similar in design to the 10½ ligne, the method of holding the movement in place is somewhat different. Instead of using a flexible ring, there is attached to the movement a steel spring, the free end of which normally projects above the movement, as shown in Fig. 24. The back of the case presses on the end of the spring and this holds the movement against the ledge in the case.

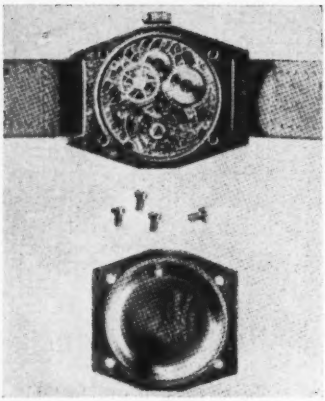

Fig. 23. Pierce 8¾ ligne watch with back removed. A steel spring screwed to movement serve to keep movement in place.

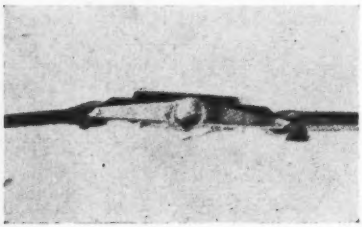

Fig. 24. Side view of Pierce 8¾ lighe watch with back removed. Note steel spring projecting from movement.

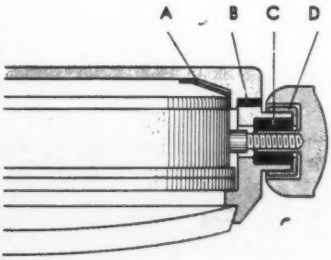

Fig. 25. Cross section of Pierce waterproof case.

A cross-section of the Pierce case is shown in Fig. 25. At A is the spring ring used to hold the 10½ ligne movement in place. At B is the flat metal gasket between the case and back, and at C is the soft composition tube which seals the stem. The cover D merely holds the tube C in place.

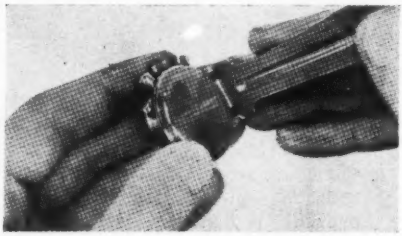

Fig. 26. How to open Heuer waterproof case.
Fig. 27. Heuer waterproof case opened.

Heuer

The waterproof case used for Heuer sport watches and chronographs represents a still different type of construction. The case is of stainless steel integral with the bezel, and has an unbreakable crystal. But, the back of the case is neither screwed on or fastened with separate screws. It is snapped on, just like the back of an ordinary case, only somewhat tighter. It cannot be conveniently removed with the usual case opener, but requires a special tool.

Fig. 26 shows how one of these cases is opened. First, the strap and spring bars are removed. Then the case opening tool is placed on the lugs of the case so that the hooked end rests on the overhang of the back of the case. The back is now easily pried off.

The movement is held in the case by two hal-head screws, which by pressing on the underside of a ledge in the case keep the movement in place. The stem is removed by releasing the detent screw.

Fig. 28 shows the construction of the case. At A is the ledge against which the case screw bear from the under side. The back of the case has a soft, composition gasket B inlaid in it. When the back is snapped on, its tension causes this gasket to be pressed firmly against a ridge on the case, thus making a seal against moisture. The stem is waterproofed by

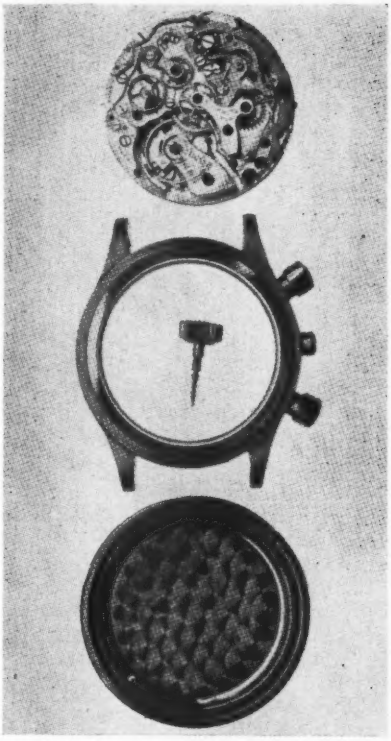

Fig. 28. Cross section of Heuer waterproof case.

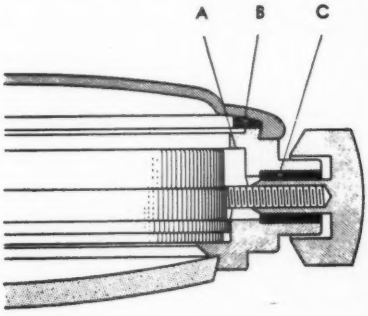

Fig. 29. Construction of chronograph pusher on Heuer case.

means of the soft, composition tube C.

The pusher for the chronograph action is waterproofed in the same manner as the stem, by a soft tubular gasket. A helical spring for return-

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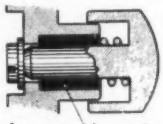
ing the pusher to its original position is contained in the button itself. This is shown in Fig. 29.



Soft, composition gasket.

The back of the case fits so tightly that it is difficult, if not almost impossible, to snap it on as one does the back of an ordinary case. A useful

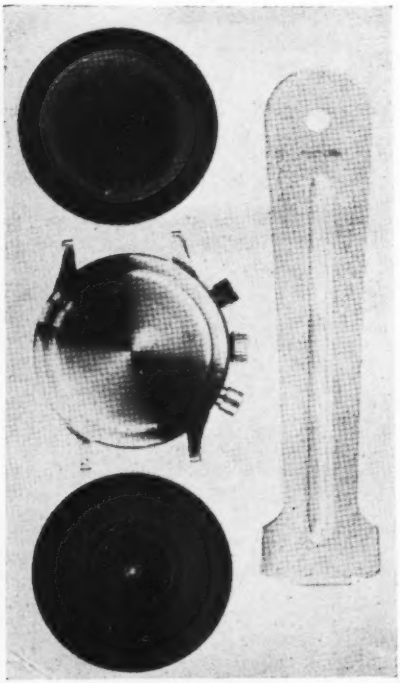


Fig. 30. Wrench for opening Heuer case and pair of blocks for snapping back on.

aid is the pair of circular blocks shown in Fig. 30. The centers are relieved so that they will touch the case only at the circumference, thus, there is no danger of damaging the crystal or movement.

The case and back are put together, placed between the blocks and then squeezed together as shown in Fig. 31, or better yet, in a press, if one is available.

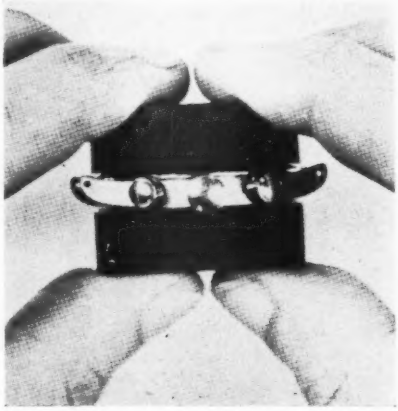


Fig. 31. How to close Heuer case.

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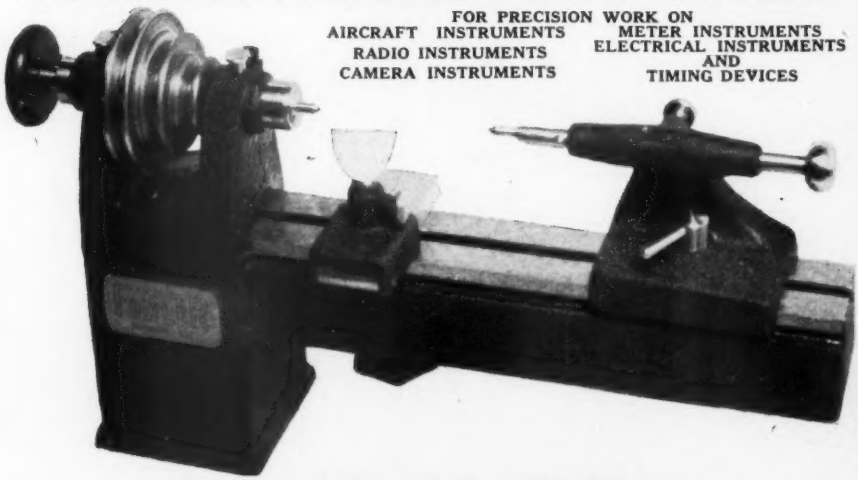

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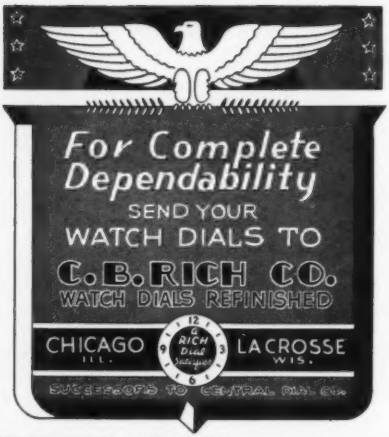

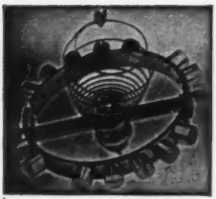

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Steel

There has been much discussion among watchmakers about steel. This applies particularly to recent graduates from the several worthy schools of horology. Evidently they have been given considerable instruction in the classes and types of steels, some of which are used by watchmakers, and some they would not be in contact with once in a decade.

The type of steel of greatest interest to the watchmaker is that which can be annealed, hardened and tempered to perform its work with the longest period of service, and with the least difficulty in working.

To recommend any particular grade or quality of steel for this work is not within the scope of this article. We are primarily concerned with an explanation of the terms, "anneal," "harden," "temper," as applied to watchmaking. To attempt a detailed set of instructions in the heat treatment of steel would involve the writing of a book. Such books have already been published, and are readily obtained from technical publishing houses or your local library would have the most complete set of books on this subject one could hope for, starting with elementary heat treatment and continuing by advancing stages to complicated and extremely delicate effort. So, we will confine our effort toward a simple explanation of the terms involved.

Annealing is the process of softening the metal heating to a high temperature and allowing to cool slowly. Steel is annealed by slowly cooling it from a low red heat. The method of annealing steel is to put the metal in a cast-iron box, cover the steel with sand, fire clay, or ashes, and heat in a furnace to the proper temperaure, then allow the box and contents to cool slowly to prevent any hardening. The material placed around the steel is to exclude the air and prevent oxidation. Steel that has around the steel is to exclude the air been annealed will produce chips that will be in long-curled lengths and the

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steel will present a more or less torn texture when worked in the lathe. In other words, the cuting tool in the lathe does not really cut, it more or less tears the metal.

Hardening is the process of heating the steel to a high temperature and then quickly quenching in a suitable cooling medium. Usually this cooling medium is water; other liquids can be used with equally satisfactory results, such as, salt water, water and soap, mercury, wax, tallow and air can be used as well.

Tempering is the process of reheating the previously hardened steel, allowing to cool slightly and quenching in order to toughen the metal and make it less brittle.

Tempering Color Scale. The following temper colors of steel and the heats corresponding are credited to The Holcomb Steel Co.:: : : : :

Color	Temp. F.
Very pale yellow	430
Light yellow	440
Pale straw-yellow	450
Straw-yellow	460
Deep straw-yellow	470
Dark yellow	480
Yellow-brown	490
Brown-yellow	500
Spotted red-brown	510
Brown-purple	520
Light purple	530
Full purple	540
Dark purple	550
Full blue	560
Dark blue	570
Very dark blue	600

Above all things, do not attempt to judge these colors in the open or bright light. Do the judging in a dark place, even one shaded or shielded to a very subdued lighting will serve, but never is a bright light.

Hubert Jenks, 3rd, of Hinsdale, Massachusetts is the proud possessor of a 120-year old patent level WATCH. The WATCH, owned by Hubert's three times great grandfather still keeps excellent TIME.

SOMEBODY CARES

By JOHN DE VOGEL,
Vice-President

Fellow craftsman, in the midst of war may I ask that you take time out for a minute or so to think of peace? The peace that lies behind and the peace that waits ahead, for these two are really one temporarily interrupted by an unpleasant interlude of war.

It is your job and ours to guard our mutual investment in a good association and name U. H. A. of A. which the public is beginning to recognize the country over as a standard for watchmakers and likewise a protection against the phony watch mechanic.

While the present war-emergency has complicated the management problems of all business men, the horologists has more than his share of difficulties right now.

It is my aim as Vice-President of the U. H. A. of A. to assit our national officers and office to offer all watchmakers the services of this organization towards the solution of as many of these present day problems as is possible.

Of course, our first duty is to do everything within our power to bring about Victory to our country as speedily as possible. We can do this best by conforming to Government regulations and the rules that the government asked us to follow.

Our organization will keep all members supplied with information and news concerning all developments within our field.

We are ready at all times to work side by side with our affiliate groups in order to put forth a solid front to encourage the passage of laws and to modify or correct existing laws so that the interest of the horological profession may be protected.

To bring this about, we will need the support of all horologists within our country.

Let us take for example "Sports". In the world of sports we often hear the expression: "A team is no stronger than its secondary strength."

Experience has taught managers, as well as league presidents, that a team must be equipped to meet any emergency if it is to win. So their only hope for ultimate victory depends upon their utility men or better known as their secondary strength.

Our association, whether it be National, state or local guilds, finds itself in the position of calling on its "Secondary Strength". We cannot be engaged in a War of this magnitude and not be short of man power to efficiently administer and carry on the affairs of our Horological Guilds and associations.

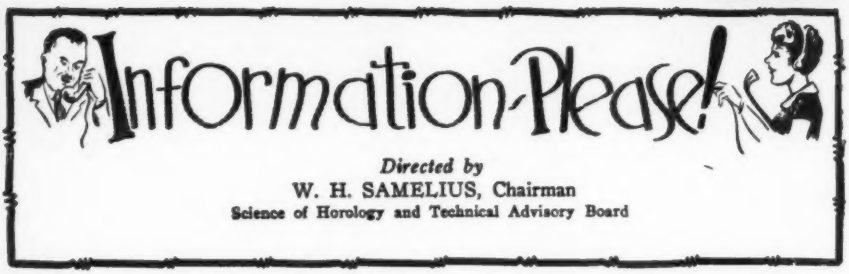
We have now approximately three quarters of our craftsman either in the Armed Forces or War-Work. For a great cause—Yes—but never the less we are striped of these men to whom we naturally look for enthusiasm and work so necessary to help council the prosperity of this Association.

I appeal to the guilds throughout our land to establish a "Secondary Strength Committee" appointed by the President of each guild or association. It would become their duty to carefully go over the membership rolls and list the members who have become inactive, their next move would be to visit these men and let them know how important it is to all of us that they become active again. Flourishing Guilds and Associations can do much to help plan the future and more over right now they can help plenty in the War-effort.

It is my sincere belief, if your guild or association follow through with this "Secondary Strength Committee", old members as well as new can be added to your roster. I will go further and say these very men will be happy to become our utility players and will want to be part of that "Secondary Strength" in order that they can help in our reclamation program.

This year the watch and clock repair departments will be subject to

(Continued on Page 35)



Directed by
W. H. SAMELIUS, Chairman
Science of Horology and Technical Advisory Board

EOK—What is meant by "Great Wheel," as referred to in a clock or watch?

Answer—The "Great Wheel" is always the largest wheel in the train of a clock or watch, and is also known as the "First Wheel." The center wheel would be the second wheel in the watch train for 24-hour work. As a second wheel in a watch sets in the center of the plates, it is commonly known as the center wheel. In an 8-day clock, we find an intermediate wheel between the great wheel and the center wheel; in that case we would have a "First" wheeler, of "Great" wheel; a second wheel and the center wheel would then be known as the Third Wheel.

RSC—Our daily broadcasts of battles being fought in the various parts of the world, naturally tells of the locality these battles are being fought; however, it would be interesting to know just what time of day or night these battles occur. Can you recommend any pamphlet that shows conversion of time throughout the world from our Standard Time?

Answer—By applying to the Superintendent of Documents, Government Printing Office, Washington, D. C., you may procure pamphlet No. M-84, Standard Time Conversion, or Chart M-155, Time Zone Maps of the United States, and C-406 Standard Time throughout the world. The usual charge for these pamphlets is 25 cents per copy.

JMcC—I am stationed at a Pacific Base. There are many seashells, and among them I have some beautiful specimens of the Abalone shells. The outside surface is rough. Can you inform me how these shells are polished?

Answer—All salt water shells can have the outer rough coating removed by a caustic potash or caustic soda, which is the ordinary soda lye sold by grocers. After removing the rough surface, they are buffed with tripoli on a bristle wheel, and after being cut down, are finished with chalk or other white powder on a cotton buff. Do not use rouge for polishing as it will imbed itself in the shell and darken its color.

Nowadays that alarm clocks are practically off the market, my customers are bringing in many old alarm clocks for repairs. Among these clocks, I find balance pivots badly worn and cone screws are badly worn or pitted. As these are all old model clocks, the jobber is unable to supply me with new ones. Is there any way of repairing these screws, making them useful once more?

ANSWER: These balance screws can easily be restored to working condition by heating them to cherry red, drawing the temper, new centers can be punched in them by using a well forced center punch that is highly polished, having a point of approximately the same angle as the old screw. When a new center has been driven into the screw, the screw can then be heated to a cherry red and quenched in either oil or water. By shaping a piece of pegwood to a point and using oilstone powder and oil to clean out the cavity, removing fire scale, the screw will then be as good as new.

Pointing up the balance staff pivots

is accomplished by inserting the balance staff in lathe and with sharp india oilstone, regrind the entire cone of pivot to it's original shape. Then with a fine arkansas stone, finish out all coarse grinding marks, finally using a burnish back file to burnish the very tip of pivot, however, do not leave the pivot to a needle point, round the extreme point, leaving .001 inch or .002 inch for tip. I might also suggest, when repairing the old alarm clocks, to examine the fork slot. In many cases, you will find a groove where the impulse jewel strikes. Removing this groove and burnishing the fork slot lengthwise with the line of motion, will increase the balance arc considerable.

JMM:—I am an apprentice watchmaker and am curious to know what is meant by pivot size No. 12.Is it a standard size of any kind, or just a number?

Answer: Balance pivots are gauged by the metric system that has been used by manufacturers for many years. Balance and train pivots alike are gauged by this method, consequently a No. 12 pivot would be a .12 millimeter in diameter, or a No. 9 pivot would gauge .09 millimeter. If you will provide yourself with a metric micrometer, you can then gauge your pivots and order staffs accordings.

JMS: Can you give me the correct time in the following towns when it is 12 noon in New York?

Answer: When it is 12 noon in New York, it is 10 A. M. in Denver, and 9 A. M. in San Francisco. It is 6:29 A. M. in Honolulu and Yokahoma it is 2:40 A. M. In Melbourne it is 9:51 P. M. In Bombay, 8 P. M. In Vienna 5:54 P. M. In Berlin, 5:09 P. M. and Paris, 5:00 P. M., London 5:00 P. M.

HO'T: I understand the army uses the twenty four hour time system. Do they have a regular 24 hour dial or a standard 12 hour dial?

Answer: When using instrument where the dial is calibrated to show 24 hours, in reading the time, it is taken directly as shown on the dial, for instance, if it is 14 o'clock and 25 minutes, orders to carry out certain movements would be transmitted that action is to be at 14:25 which, according to the 12 hour dial would read 2:25 P. M. In other words, when using a regular 12 hour dial, the number of hours after 12 noon are added to 12. Another example: 23:59 would be equivalent to 11:59 P. M.

FRB. What is the finest of gold in the United States gold coin?

Answer: U. S. Gold coins are made of 90 percent pure gold and 10 percent copper. This is done to harden the gold and give it better wearing qualities.

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AERONAUTICAL INSTRUMENT SERVICE

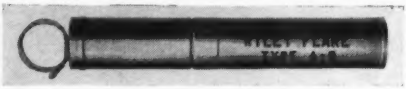
Aircraft Instruments

EDITOR'S NOTE—Aeronautical Instrument Service is a subject untouched by publications in the Horological field, or in fact by any publication. In September, 1938, THE AMERICAN HOROLOGIST inaugurated such an educational service via prepared illustrated lectures to be used by U. H. A. A. organizations for the purpose of broadening our members' scope of knowledge in this field, which offered additional remuneration to those far-sighted enough to avail themselves of such knowledge.

Parachute Flare Wiley, Type A-8

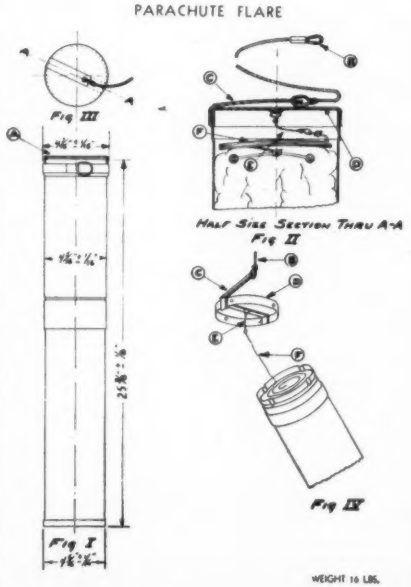
Article No. 45

The Wiley Type A-8 Flare, as manufactured by the New Jersey Fulgent Company, and sold exclusively by the Pioneer Instrument Company, insures safe and positive ground illumination for emergency landings of aircraft at night.



The A-8 Flare burns with an intensity of 300,000 to 400,000 candlepower, for a minimum of three minutes. This will illuminate an area of approximately one and a half miles in diameter from an altitude of 25,000 feet from the ground. Superior design and methods of manufacture assure even burning of the candle which gives maximum intensity and burning time. The parachute of the A-8 Flare has been carefully designed to give an average rate of descent of 360 feet per minute without oscillation. The Flare may be safely released at an altitude of 1200 feet above the ground without danger to life or property beneath it. The Flare is enclosed in an hermetically sealed metal container to protect it against deterioration, thus eliminating the necessity of returning to the factory for periodic inspection. These features, plus dependability and safety, have caused Wiley Flares to be specified as standard equipment on practically every airline in this country, as well as many foreign airlines.

The Flare is mounted in a convenient place in the airplane and a cable connects the releasing mechanism to a handle located convenient to the pilot. In releasing a Flare, it is advisable to have the nose of the plane pointed downward. Nosing up might cause the tail skid or wheel to foul the parachute. Fast airplanes should be throttled back to a speed of not more than 150 miles per hour when releasing a flare. At higher speeds, the airplane will quickly pass out of the range of the flare, and for this reason it has not been designed for higher speeds. The Wiley A-8 Flare has been assigned the Department of Commerce's Approved type Certificate number 46, for use on all types of aircraft.



Installation and Operation

The design of the A-8 Flare permits great flexibility of mounting. It may be placed horizontally in a wing or vertically, or at an angle in the fuselage. Due to the variety of possible mountings, no bracket is furnished. A simple bracket and releasing system may be easily constructed to suit the particular installation requirements. Be sure that the installation is such that the Flare can be instantly released without fouling and that the mounting bracket does not cause friction on the tube which might break the hermetic seal.

Figure 1 shows the Flare as it is shipped. The cap "A", which covers the releasing cable, is to protect this part during transit. When installing the Flare, cap "A" is removed, exposing releasing wire "B," as shown in Figure II, III, and IV. The free end of this wire is made fast to the plane. The other end is attached to a metal band "C" prying off the cover, which falls free.

The purpose of this construction is to leave only the light band attached to the ship after the Flare is released, as any heavy part might swing back and damage the covering of the ship.

Attached to the lower end of the fine wire "E" (Figure IV), leading from strip "C," is eighteen feet of cord "F." When this cord has been fully extended, it begins to pull out the chute and shrouds to which it is fastened. The length of the chute and shroud is eighteen feet. The candle will, therefore, reach a distance of thirty-six feet below the plane before ignition takes place.

After the chute has been pulled out of the case, the full weight of the Flare is supported momentarily by the small wire "E," which breaks, as the wire will hold a weight of only eight pounds, and the complete flare weighs approximately sixteen pounds. The Flare falls free and the chute opens. The jerk caused by the opening operates the igniters.

The igniters set off a flash which in turn ignites the bottom of the candle. The metal container surrounding the candle burns with it so that no metal or other parts fall during combustion.

The method of releasing and igniting the Type A-8 Flare has been proven the safest and most reliable system. As the Flare is 36 feet below the plane and entirely released from it before ignition can take place, there is no danger of fire.

(Continued from Page 31)

many unusual conditions, it is the U. H. A. of A. intentions to continue to serve the affiliate guilds, its members and all horologists to a better and greater advantage than here-to-for.

Cooperate therefore with your local, state and national associations, become a member and receive the news facts monthly through the most Unique Editorial formula within our field of endeavor, The American Horologist.

I solicit your aid and suggestions and will be glad to have you write me through the national office or to our National Secretary at the National office, located at 226-228 Sixteenth Street, Denver, Colorado.

The War will end. Let us look to the Great Day when our boys come marching home. We want to welcome A. of A. than they left because them back to a better guild and U. H. A. of A. than they left because "Somebody Cared."

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Minnesota Board of Examiners

Reading from left to right: Harry H. Johnson, Spring Valley, Minnesota; C. W. Gaskell, Secretary, 415 Bremer Arcade, St. Paul, Minnesota; W. C. Westphal, President, Minneapolis, Minnesota; Paul E. Teske, Hibbing, Minnesota; John G. Crooker, Fairmont, Minnesota.

A simple pendulum CLOCK made in one part of the world may not remain accurate in another, because the pull of gravity is not the same at every spot on the earth's surface.

When you go to call on the Wendell Willkies, don't ask the TIME. There isn't a CLOCK in the Willkie house.

The Pay-As-You-Go Income Tax Law

The current tax payment Act of 1943, popularly called the "Pay-as-you-go" income tax law, does not impose new taxes on individuals but provides for the collection of tax on income as earned and designates the proper procedure. The benefits of this Act are limited to individuals, not to estates, trusts or corporations.

This Act concerns withholdings from wages of employes, hence, the watchmaker-jeweler becomes a temporary collector for the government and this complicates payroll procedure. Numerous new sections have been added to the Code to cover payroll withholdings and about all we can say that this legislation begets an employer is a bigger payroll job. All existing provisions for figuring taxable net income remain the same. The new Act relates solely to the method of payment and collection of tax. Aside from payroll deduction, it does not touch any previous regulations covering an element of business operation, such as depreciation or bad debts. Twenty per cent of wages and salaries in excess of exemptions must be withheld from the employe's pay by the employer. The Internal Revenue Department provides tax-rate schedules in Circular WT, which you should read carefully, and inasmuch as payroll withholdings went into effect July 1, 1943, all employers should be familiar with the general deduction practise by now, so we shall not take up white space detailing the method of computing withholdings, but rather, discuss the features of the Act that those in this field have queried us about.

Wages are any form of remuneration paid, salaries, bonuses, overtime,

commisison on sales, percentage of profits, hourly, daily, weekly or monthly compensation paid in cash, stocks, bonds or other property. Wages paid in any other medium than cash must be computed at fair market value at the time of payment. The tax on such wages must be paid in cash and it is up to the employer and employe to see that such cash is made available. Vacation allowances, dismissal wages and deductions from the employe's pay for taxes, social security, war bonds, etc., are wages. If an employer pays an employe's tax liability, without deducting it from his wages, under a state unemployment compensation law, the amount must be included in wages.

The Act does not specifically cover traveling and other expenses but it appears that the same rule will follow that of the Victory Tax, which states that, "amounts paid or reimbursements made to employes specifically for traveling or other expenses incurred in the business of the employer", are not subject to withholding. In certain cases, there may be doubt as to whether an individual is an employe or not and this must be determined by an appraisal of the relationship. In general, an employe is subject to the will and control of an employer, not only as to what shall be done but how it shall be done. The right to discharge is also an important factor, indicating that the person possessing that right is an employer. An employer may be an individual, corporation, partnership, trust, estate, joint-stock company, association or other unincorporated group.

There are 2 methods of computing the withholding tax, the "exast percentage calculation", or "prescribed percentage rate", as Circular WT describes it, and the "wage bracket" method. The employer can use either one, and he may exercise this option between one employe and another, using one method for one employe, the other method for the next. Wages may be computed to the nearest dollar under the "exact percentage cal-

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culation", when figuring the amount to be withheld, but this provision is new and apparently does not apply if the wage payment ends in an even half dollar, say $31.50. If wages are rounded off, a fractional part of a cent may be disregarded in the tax compution unless it is ½ cent or more. The employer must collect 20 per cent of the excess of each wage payment over the "family status withholding exemption", as listed in a table, which is part of the law. The watchmaker-jeweler should have a copy of this law on hand to make sure his withholdings are correct. The 20 per cent figure includes 3 per cent net Victory Tax and 17 per cent, calculated to approximate the normal tax yield of 6 per cent and the first-bracket surtax of 13 per cent on wages.

The withholding exemption is determined by reference to the employe's payroll period, the period for which a payment of wages is ordinarily made), without regard to the basis used in computing compensation. The same rule applies whether the "exact percentage calculation" or "wage bracket" method is used. A schedule showing withholding exemptions by payroll periods is given in the law. Where payments additional to wages are made, prior regulations decreed that only one withholding exemption was allowed for the total payment, and this rule would apply, for example, to a salesman paid a salary plus a commission on sales, a repair man paid a specific hourly rate, with a bonus for output where the payroll period is weekly, an office worker paid a fixed salary plus time and a half for overtime during the period.

Under the "wage bracket" method, the government supplies 3 tables, weekly, byweekly, semimonthly, monthy and daily or miscellaneous payroll periods. A "miscellaneous payroll period", not defined under the Victory Tax, means a payroll period other than those just mentioned. If an employer, for example, pays every 10 days, that is a "miscellaneous payroll period". The tax withheld under the "wage bracket" method is a single sum corresponding to the 20 per cent figure used in the "exact percentage calculation" and takes into consideration the status of the employe as reported in his withholding certificate exemption.

Remember that withholding does not affect the liability of the employer for income (including Victory) tax. Because an employer is not subject to withholding, does not exempt him from tax. The individual employer doesn't receive a salary in the eyes of the income tax law. His income is his net profit. From the standpoint of good accounting, the individual employer should continue to consider he receives a salary, otherwise, this expense will not be included in his costs and he would short-change himself when computing selling prices. From an accounting standpoint, his net profit is what is left after his salary and other expenses are deducted but when filing a return he cannot include his salary as part of overhead expense. As an employer under the new Act, the individual does not withhold part of his own compensation, but estimates his income on September 15th and then files an adjusted return in March.

The Victory Tax, as a separate levy, will be collected from few employes, only those who owe no regular income tax and then the tax withheld should be at least 3 per cent of the excess over the prorated Victory Tax exemption of $12 weekly.

Effect On American Workers of Importations of Swiss Watch Movements and Watches

By Roland Gsell

(From Congressional Record—Appendix June 2, 1943)

Dear Mr. Chairman: The American Watch Assemblers Association is concerned with misleading statements made before the committee on Ways and Means of the House of Represen-

tatives, and repeated before the Committee on Finance of the Senate, at hearings held before those two committees on House Joint Resolution 111, a resolution to extend the authority of the President under section 350 of the Tariff Act, as amended. These statements refer particularly to the alleged effect upon American workers and American watch producers of importations from Switzerland of watch movements and watches under the existing reciprocal trade agreement between Switzerland and the United States and the alleged benefits resulting to Germany from this business.

The association asks the committee to consider the following information:

American dollars paid to Switzerland are not available to Germany. They are held here in the United States, deposited in the blocked account of the Swiss Natinoal Bank. Payments for all imports from Switzerland are made into this account as directed and licensed by our Federal Reserve Bank. The Swiss National Bank, which is comparable to our Federal Reserve bank, pays the Swiss exporters with its own Swiss francs against the blocked dollars held in the United States. The Swiss manufacturer spends those francs in Switzerland to pay his labor and other production costs. None of it goes to Germany.

Nor does it go to Germany for materials used in watches. Practically all of the steel used in Swiss-made watches comes from Sweden. The brass used in Swiss-made watches most likely is made from copper imported from the United States in 1940. In that year, with the countries around her at war, Switzerland bought from the United States and stored enough copper to supply her needs for a great many years.

Moreover, extremely strict control is exercised by Switzerland over funds remitted by her citizens into Germany. Even had Germany supplied all the brass going into all the Swiss-made watches imported into the United States during 1940, 1941, and 1942, the actual weight of the brass so used would have had an import cost into Switzerland of more than $15,000.

And even had all the raw materials come from Germany—which they did not—surely it is infinitely better to have the material converted into watches for use in the United States instead of fuses, instruments, or other war materials for use in Germany.

The domestic manufacturers often have contended that the wages paid to skilled labor is practically the cost of a watch movement. Cost of the raw material in a watch movement is negligible. The benefits and advantages to us in keeping highly skilled Swiss workers employed in making watches for our use rather than producing needed war materials for Ger-

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many are so obvious as to need no comment. While they are working for us they are not working for our enemies. Importations from Switzerland help meet America's present need for watches, which American manufacturers cannot now supply.

There is no stock pile of Swiss-made watches in the United States. We have about 20,000 retail stores dealing in watches, and not one has an adequate supply of watches. American-made watches are in great demand but unobtainable, and this accumulated demand for American-made watches will be stronger than ever; after the war domestic manufacturers will have to use all their facilities to supply that demand.

Competition from Swiss watch importations did not reduce the number of American watch factories. It was more than 20 years ago that we had 60 American watch manufacturers. Every one of them making jeweled watches, and many of them making nonjeweled watches, imported many of their parts and much of their machinery from Switzerland. Few watches were imported from Switzerland during the years when most American factories went out of business. Competition amongst themselves, lack of capital, lack of quality, failure to keep abreast of style changes, business failures, and mergers caused the reduction in number of American manufacturers. Those same factors are found in the histories of other industries in the United States, such as the automobile industry for instance. Forty years ago, more than 100 firms were making automobiles. Today there are only 5 major automobile manufacturers.

The policy of reciprocal trade agreements has been adopted by the United States Government. The production of watch movements and watches is one of the principal industries of Switzerland. Naturally, Switzerland is seeking an outlet for this production. We should take it, not let it go to Germany. The State Department entered into this trade agreement because it is advantageous to the United States. Its work should not be undone.

Respectfully submitted,
American Watch Assemblers Assn.

Michigan Horological Convention

5th Annual Convention July 28th, 1943

Through the courtesy of the Michigan Retail Jewelers, the Michigan Horological Association, held its 5th annual convention at the Greenridge Country Club, Grand Rapids, Michigan. It has been a privilege to meet with the Michigan Retail Jewelers for the past five years.

The meeting was called to order at 3:00 P. M. by President Sid Thompson, Stanley Gaver gave the Secretary and Treasurer reports approved as read.

President Sid Thompson gave a very fine talk on the watch repair department today. We have brought our prices on watch repairs up to it's proper standard, let's keep it there and not drift back to the old cut-throat prices that prevailed a few years ago. Lets make the watchmaker more professional, the standard he once held in the eyes of the public. It was suggested that the guarantee period on watch work be limited to 90 days.

Many interesting topics were discussed from the floor.

The problems in the repair department today are quite serious in most of the stores, shortage of watchmakers, is the most serious, most stores being 3 to 6 months behind on work, also the scarcity of materials. In face of all the troubles the watchmakers are making the best of it. Our biggest worry is ending the war, the rest will take care of itself.

All of the present officers were retained for the ensuing year:

President, Sid Thompson; Vice-President, Horace Cole; Secretary-Treasurer, Stanley Gaver.

Some changes were made in the board of directors:

Chairman of the Board, T. F. Barnes; Trustee, Glen Hammer; Truste, Bert VandenBerg.

A very fine Banquet was served by the Greenridge Country Club.

BOOK REVIEW

Company Museums

By LAURENCE VAIL COLEMAN

Director of the American Association of Museums

A book for business men. Its main purpose is to show the nature and usefulness of company museums. but it may serve also as a guide for people who have museums of this kind to manage.

Company museums are museums belonging to industrial corporations, commercial houses, railroads, public utilities, newspapers, banks, insurance companies, and other concerns. These museums are used for business reference and public relations. They are devoted to the history, past and current, of their parent companies and to technical matters in their lines of business.

The appendix of the book describes eighty company museums in the United States and three in Canada.

Published: June 1943
By the American Association of Museums
Cloth, viii plus 174 pages, indexed
With 18 halftone illustrations.
Price: $2.50
Book Department
The American Horologist

"The Curious History of Music Boxes"

By ROY MOSORIAK

This is a most welcomed addition to all Libraries of music box lovers and Horologists', covering history and service.

242 pages, heavily illustrated.

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Horological Association of California—Los Angeles Guild

Minutes of the meeting held on July 21st, 1943.

Meeting opened by Chairman A. G. Lyons. Minutes read and approved. Letter from National office in regard to a National Conference read and discussed. John Nooyen announced that he would attend this conference if held in Denver. Chairman Lyons presented a report on OPA action in regard to the cheap Swiss watches that are now flooding the country. The meeting was turned over to Mr. Nooyen at this time as he had consented to act as the Chairman for the evening and to arrange the program for this meeting. Mr. Nooyen reported that Glen Meyer of this Guild, now in the U. S. Army had been sent to the Elgin College for a 16 weeks course and upon completion of this course had been transferred to Camp Pickett in Virginia to serve as an instructor at this post. Mr. Nooyen presented a very interesting technical talk covering the making and use of small tools, jeweling problems, putting new teeth in small wheels. Mr. Nooyen brought out a number of interesting methods of tackling the troublesome jobs that we all encounter from time to time. This talk was enjoyed by everyone present and it

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111 E. 31th St. Kansas City, Mo.

Instrument Repairing

was an inspiration to everyone hearing it to resolve to become a better Horologist. A door prize of one dozen Sandsteel mainsprings donated by Fred Palm was won by Mr. H. L. Gruber who returned them to the Guild to be used as a prize at the next meeting. As many of our members are on vacation in August there will be no meeting held next month but a big and important meeting is being planned for September.

H. I. A.

A mail ballot vote was taken recently for election of officers of the Horological Institute of America for the year ending May, 1944. As a result the following officers were elected.

President — Howard L. Beehler, Lancaster, Pa.

First Vice President—Frank D. Urie, Elgin, Illinois.

Regional Vice President—Herman R. Pedrick, Philadelphia, Pa.; Alfred S. Rowe, Indianapolis, Ind.; S. George Cochron, Nashville, Tenn;. George J. Wild, Peoria, Illinois; Stanley A. Pope, San Francisco, California.

Treasurer—Edward H. Hufnagel, Mt. Vernon, New York.

Executive Secretary — Ralph E. Gould, Washington, D. C.

Additional members of the Executive Committee: John J. Bowman, Lancaster, Pa.; Fred G. Gruen, Cincinnati, Ohio; Milton F. Manby, Lancaster, Pa.

R. E. Gould, Sec'y.

Metal Plating of Plastics Now Done By Precision Paper Tube Co.

New Process Securely Bonds Plating Metals of All Plastics, Glass, etc., at Big Savings

A new process by which plastics, glass, or any non-conductor, is perfectly plated with any of the plating metals, is announced by Precision Paper Tube Company, Special Products Division, 2023 West Charleston Street, Chicago 47, Illinois.

Plating of plastics in the countless range to which this great improvement is applicable is now in progress in Precision's complete setup for this work.

By Precision's new process the plating goes on the plastics as perfectly and as permanently as the best in any plated metal. Convex and concave surfaces, convolutions, corners and recesses are as thoroughly plated as flat or simple round surfaces. The metal plating is permanent. It does not crack, chip, nor peel off in long and severe service.

The advantages are many. Critical and strategic metals are conserved. Production costs are greatly reduced. Weight is saved. Design can be much simplified. Dimensional stability is insured. Oils, solvents and moisture cannot be absorbed. Electrolytic corrosion between dissimilar metals is eliminated. Heat resistance is increased.

Precision's new process can be used for plating magnetic and electric shielding of all kinds—radio shielding, electrostatic and magnetic shielding, applications as coil shields, condensers, etc. Thousands of plastic articles can be made more permanent, more beautiful. Plastic articles can be had to match any of those made of metals. Conductor and insulator can be combined in one unit.

Both rigid and pliable types of plastic tubing and pipe fittings can be plated. The uses of the process extend into all electrical and mechanical manufacture.

It is a welcome application to scientific instruments where lightness with solid precision is desirable.

Precision engineers will be glad to counsel with manufacturers on applications of this new process to their products. An invitation is extended to write for detailed information and estimates.

The Watchmakers Association of New Jersey

Is planning for a big open meeting in September, holding a membership drive, meanwhile trying to get former members to reinstate, and to hold a State Convention, to be held in Newark, New Jersey at the Essex House, in the month of October, 1943.

International Silver Workers Win "E" Flag For Exceptional Jobs

Unusual Peace Skills Put To Precise War Work Also Bring Honors From City and State

Meriden, Connecticut, July 22. Upon learning that the Government had awarded International Silver Company workers not one, but two Army-Navy "E" flags on the same day Mayor Francis R. Danaher proclaimed July 27 "Silver Award Day" for citizens of the "Silver City."

In one of the first stream-lined award ceremonies in this region, lasting only a half hour, Admiral Wat T. Cluverius, on behalf of the U. S. Navy, personally will award the "E" pennant to E. C. Stevens, president of the world's largest silverware manufacturers who will accept the flag for the Company's employees. Lieut. Colonel Howard F. Currie, Commanding Officer, New York Medical Department, Procurement District, will present the "E" pins, which are made of sterling silver, to twelve employees on behalf of the United States Army.

The twelve employees selected from the more than 1,500 who will receive "E" pins at the ceremonies at Insilco Field are: Anna Barrett, Anna Mazzeo, Ernest Cheeney, Arthur Gross, Philip L'Heureux, Carlton Mandeville, Albert Stevens, John Musec, Joseph Pinarcik, Walter Weitzel, Charles Yale, and Charles Saleski. Albert Cheeney will make the acceptance speech on receipt of the "E" pins in behalf of more than 1,500 employees. United States Senator Francis T. Maloney will preside as master of ceremonies.

Governor Raymond E. Baldwin rearranged a series of long scheduled conferences for that day in order to be present at Insilco Field and join the city and state in honoring the highly skilled and patriotic silver craftsmen, whose sensitive fingers and creative imaginations now are employed 100 percent on war production. The Company is making more than 100 different items, which are used by virtually every type of craft afloat and aloft, and all branches of the armed services.

"Silver City" may be the name of one of the liberty ships soon to be launched. To emphasize the importance of this naval award of the "E" and thus preserve it in naval annals, Admiral Emory S. Land, Chairman of the Maritime Commission, has referred the naming of a ship "Silver City"—thus honoring Meriden, the world's largest silver manufacturing center, and International Silver's employees—to the committee on selection of ship names. When Meriden citizens heard of the possibility of having a ship named "Silver City" they expressed their hearty approval through business, labor, political, and social leaders.

This city of stately elms, white churches, and historic museums no longer lives the more leisurely pace of peace-times. Although its streets are dimmed after night-fall virtually all factories, and especially the plants of the International Silver Company, are lit seven days a week and twenty four hours a day. The Silver Company has an unusually low absenteeism record, because craftsmen, during war as well as in peace times, takes a genuine pride in their daily work.

The Watchmaker's Outlook

Mr. Howard Beehler, President of the Horological Institute of America, said before their last gathering, that the watchmakers of America are a group of specialists, operating in a changing world.

How true this is, and what opportunities are before us in the horological field! So many of the watchmakers have been called into service because of their skill in precision work. They are in the construction, maintenance and repair of aircraft as well as war instruments, and in many other fields of war endeavor where precision is necessary.

As a step in this direction, we reprinted articles and chapters on the subject, from the Horological Journal of London, combined them into a book, which we have mailed to the trade, for the good of the cause at our own expense, and which has been declared by the officials of the U. S. War Department, Schools and war plants, as one of the most interesting, simple, and instructive books for the purpose.

A few years ago I made a trip to a Watchmakers Convention at Indianapolis, and was surprised, on visiting one of the jewelers, that the people in that town maintained an Aviation Association, and the clerk in one of the jewelry stores I visited, was a member who flew to Detroit and other cities, in his plane evenings. How far this will develop, how far the watchmaker and jeweler may be called upon for maintenance and repairs, is something only the future can tell, but it is well to be on the alert and on the watch for all these things add to our business by bringing in customers and adding to our sales.

With the discovery of Radar which has aided us unbelievably in the winning of Naval battles, the marvelous rapidity of oscillation of this "tube" which encircles the globe eight times in a second,—the already available accuracy of the Paulson Time Micrometer with its precision control, accurate to one tenth of one millionth of a second, it seems to portray most encouraging possibilities.

There seems to be no limit as to the extent that these scientific discoveries may be utilized. They perhaps open many fields of expansion and endeavor where our skill and precision workmanship may be in big demand. Therefore to apply them to our business, and aid its expansion and growth should be the effort of all in our line. What instruments may be necessary, what upkeep and maintenance may be required for these instruments, are all part of the future to which watchmakers may look forward with pleasure and profit.

Vice-President of F. H. Noble & Company Dies

John M. Shields, Vice-President and Secretary of F. H. Noble and Company, died in his home at 10903 South Hoyne Avenue, Chicago, on July 20, 1943, at the age of 67 years.

After a brief apprenticeship in his Father's Drug Store, went to Bradley Polytechnic Institute where he completed the regular course in watchmaking and engraving. On graduation became associated with W. P. Hitchcock Company, wholesale material dealers, Syracuse, New York. From here he moved to New York City as salesman for Farrington Mfg. Co., later becoming Sales Manager for that Company.

Mr. Shields was one of the founders and officials of Chicago Case Company with which he was associated until 1917 when he joined the organization of F. H. Noble and Company, 559 West 59th Street, Chicago, manufacturers of Jewelers Findings. He started the manufacture of Jewelry Boxes, and for 25 years has managed the Jewelry Box Plant which has grown from an infant to an industry of nation-wide proportions.

Elgin Man Promoted

Daniel A. Brophy, controller of the Elgin Watch Company, Elgin, Ill., has been elected to membership in the Controllers Institute of America, a technical and professional organization of controllers devoted to improvement of controllership procedure.

SPECIAL NOTICES

WATCHMAKERS WANTED:
"Old established Gentile store wants first and second watchmaker. Permanent position. $50.00 to $75.00 for 48 hour week. Molinelli's Jewelers, Pocatello, Idaho.

WANTED:
"Watchmakers — Accustomed to Factory work. Fine Position. Reliable Watch Importer. Good Salary and prospects." Box 537, THE AMERICAN HOROLOGIST, 226-228 16th Street, Denver, Colorado.

Watchmaker Wanted to clean watches only (or) clean staff and jewel only in well established Trade Shop. Ideal working conditions. Hours 9-6. Average Watchmaker can make from $100.00 to $150.00 per week. Give reference for last five years in 1st letter. Write: Clarence J. Lee, 609 Liberty Building, Waco, Texas.

Wanted, Watch Rate Recorder. Mention price and kind and what condition. John Bulger, Prince Rupert B. C., Canada.

Lathe Repairing, Wheel Cutting, Special Watch and clock parts to order. Estimates on all work. (No general Watch Repairing) Jes I. Hansen, 1007 Marion St., Denver, Colorado.

MISCELLANEOUS
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Webster Whitcomb Lathe, 3 slide rest, wheel cutting attachment. Jeweling calipers, index plate, drill check mounted on tailstock spindle. Hardinge pivot polisher WW. Hardinge 4 jaw chuck-four inch Magnus-Webster Whitcomb Magnus fact plate. LORSCH SCHMIDT lathe, slide rest extra level tailstock, 3 index plates 70 rows holes, 2 latches, universal head and bed. Rex engraving block, gravers, Crocker graver sharpener. Hamilton Beach motor. 7 piece drawing set. Wheel cutters sizes 7 to 100. Rounding up cutters sizes 16/0 to 28. Diamond powder fine, medium, course, granulated, chips. Ring mandril and frazing tool. Thaomas C. Mazas, 15 West South Temple, Salt Lake City, Utah.

TOOLS FOR SALE
New and Used Wheel-Cutters; Slide-Rests; Lathes and Attachments. Cash paid for Used Watchmakers' Lathes and Attachments. R. P. "Dick" Gallien, 220 W. 5th St., Los Angeles, Calif.

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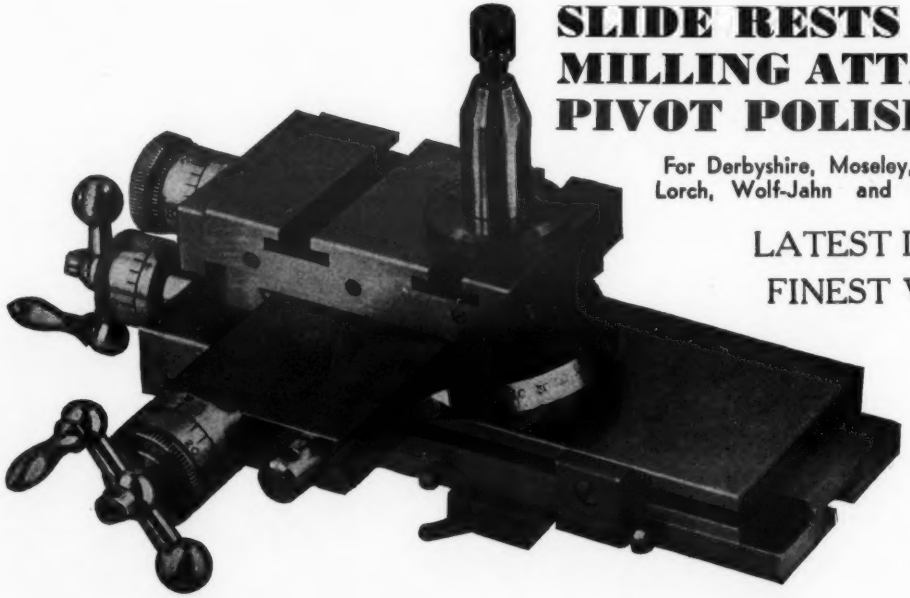

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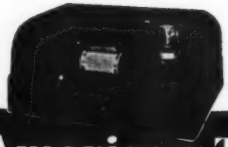

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